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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/445,892	04/24/2000	SHIGETOSHI SEGAWA	MAT-7855US	1490

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LAWRENCE E ASHERY
RATNER & PRESTIA
ONE WESTLAKES BERWYN SUITE 301
PO BOX 980
VALLEY FORGE, PA 19482-0980

EXAMINER

MAYES, MELVIN C

ART UNIT PAPER NUMBER

1734

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/445,892

Applicant(s)

SEGAWA ET AL.

Examiner

Melvin Curtis Mayes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,7-10 and 14-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,7-10 and 14-16 is/are rejected.
- 7) ☒ Claim(s) 17 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

(1)

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(2)

Claims 1, 3, 4, 9, 10, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-218675 in view of Mikeska et al. 5,085,720.

JP 10-218675 discloses a method of manufacturing a multilayer substrate comprising: providing a shrinkage restraint green sheet on each side of a green sheet laminate having conductor filled via holes and conductor pattern; firing the laminate; and removing the ceramic powder residue of the restraint green sheets from both sides of the substrate by water jet blast of projection material in a hyperbaric-pressure airstream. When the restraint greensheets are made of MgO, the projection material in the blast is fine particles of MgO. JP '675 discloses using projection material of particle size of 10 micrometers and carrying out water blast by hyperbaric-pressure stream at 4.5 kg/cm^2 . JP '657 further discloses using alumina as the projection material when using alumina as the material of the ceramic for restraint and discloses that elimination nature is good and the ceramic of restraint is removed completely from the substrate (translation pg. 2-3, specifically paragraphs [0017]-[0026]). JP 10-218675 discloses that the green sheet laminate has vias for electrical connection but does not disclose that the green sheet laminate has a cavity which is covered by the restraint greensheet.

Mikeska et al. teach that in using green tape release layers to reduce shrinkage during firing of a green ceramic body, the green tapes used to make the ceramic body frequently contain vias for electrical interconnection, registration holes and other perforations to accommodate devices and chip attachment. Mikeska et al. teach that even when the green tape contains such perforations, the method remains effective to reduce X-Y shrinkage (col. 10, lines 13-19).

It would have been obvious to one of ordinary skill in the art to have modified the method of JP '675 for manufacturing a multilayer substrate using shrinkage restraint green sheets by providing the green sheet laminate with a cavity, as Mikeska et al. teach that green tapes used to make the ceramic body not only frequently contain vias for electrical interconnection but also contain perforations to accommodate devices and chip attachment. Providing the green sheet laminate with a perforation (cavity) to accommodate a device or chip would have been obvious to one of ordinary skill in the art, as taught by Mikeska et al., as frequently provided, and success of the shrinkage restraint green sheet covering the green sheet laminate having the cavity to restrain shrinkage would have been expected, as Mikeska et al. teach that even when the green tape contains such perforations, the method remains effective to reduce X-Y shrinkage.

Applicant cannot rely upon the certified English translation of the foreign priority document to overcome this rejection because the foreign priority document does not provide support for the claims. The foreign priority document, as evidenced by the translation, does not provide support for the limitation "the mean particle size of the particles of said ceramic powder is not greater than 10 μm " as now claimed in Claims 1 and 9. Since the foreign priority document does not provide support for this limitation, the claims are not entitled to the foreign

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priority date (4/24/98) to overcome the JP 10-218675 reference (publication date 8/18/98). Based on the certified English translation, the foreign priority document provides support for using a ceramic such as alumina in combination with water and air at a pressure of 3-4 kg/cm².

(3)

Claims 7, 8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above, and further in view of Yam et al.

Yam et al. teach that abrasive media such as glass beads, alumina or sand can be collected and reused for additional blast cleaning (col. 1, lines 23-34, col. 4, lines 1-4, col. 5, lines 20-22).

It would have been obvious to one of ordinary skill in the art to have modified the method of JP '675 by collecting the ceramic projection material after water jet blasting as taught by Yam et al. for reuse for additional blast cleaning.

Performing water jet blasting under hyperbaric-pressure airstream on both sides of the fired substrate simultaneously, as claimed in Claim 7, would have been obvious to one of ordinary skill in the art, for speeding of removal of the ceramic powder residue of the restraint green sheets from both sides of the fired substrate.

Allowable Subject Matter

(4)

Claims 17 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

(5)

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection, applied because of the amendment to Claims 1 and 9.

(6)

Applicant argues that JP 10-218675 teaches that the process provides a flat surface for the ceramic board and that one of ordinary skill would not have been motivated to use the process of JP '675 to remove a ceramic layer from a board having a cavity.

It is true that JP '675 discloses that the process of using the blasting process to remove the ceramic powder residue of the restraint green sheets improves flat property of the multilayer ceramic substrate, but this does not teach away from providing the multilayer substrate with a cavity. As taught by Mikeska et al., green tapes used to make the ceramic body not only contain vias for electrical interconnection but also contain perforations to accommodate devices and chip attachment, and even when the green tape contains such perforations, using restraint green sheets remains effective to reduce X-Y shrinkage.

Conclusion

(7)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

EP 0 535 711 teaches using restraint green sheets with a green sheet laminate having cavities (Fig. 6).

(8)

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

(9)


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 703-308-1977. The examiner can normally be reached on Mon-Fri 7:00 AM - 3:30 PM.

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After December 22nd, the Examiner can be reached at telephone number 571-272-1234 and rightfax number 571-273-1234.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 703-308-3853. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM